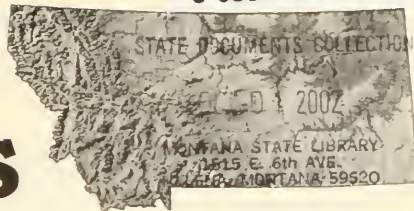


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Montana GIS News



Montana GIS News

Winter Edition, 2001

2001 Intermountain GIS Users Conference in Boise, Idaho *"GIS in Our Backyard"*

By Bryant Ralston, ESRI and Margie Lubinski, USFS

The Northern Rockies Chapter of Urban & Regional Information Systems Association (URISA) and the Montana GIS Users' Group continue the tradition of outstanding GIS conferences with the announcement of the 2001 Intermountain GIS Users' Conference to be held April 30-May 3, 2001 in Boise, Idaho.

Boise, "The City of Trees," is nestled against the foothills of the Rocky Mountains, along the Boise River. Boise has the energy and attractions of a large city along with the warmth and hospitality of a small town. Boise attractions include: the Boise Greenbelt, along the Boise River, which consists of 40 miles of trails for cycling, walking, skating and jogging; golfing at more than 15 area golf courses, sight-seeing and tours through parks, museums and the capitol building; horse racing; auto racing; fishing; and shopping.

The main conference will be held on Tuesday and Wednesday, May 1-2 and workshops will be offered on Monday, April 30th and Thursday, May 3rd. The conference facility will be the Boise Centre on the Grove, right in the heart of beautiful downtown Boise. Lodging, shopping, dining and

entertainment are all within easy walking distance of the conference activities.

The 2001 conference will explore how the common threads of GIS are woven together to support responsible use of GIS in our backyard. It doesn't matter if our backyard is the next door neighbor, a wilderness area, or the transportation routes that connect our cities, counties, and states. GIS and its related technologies are influencing the water we drink, the food we eat, the power in our homes, and the roads we travel by providing critical information for the decision-makers who represent us.

Keynote Speakers

Scheduled keynote speakers include Dee Ann Davis, a Washington, D.C. based researcher specializing in GIS, GPS policies and the "Capitol Outlook" columnist for GeoSpatial Solutions magazine, Tim Walsh, Marin County, California, Fire Captain Specialist, responsible for wildland fire risk assessments using GIS, and J.D. Williams, the Idaho State Controller, responsible for the financial management of Idaho state government including the operation of the state's largest Computer Service Center, and an active proponent of electronic government.

(Cont. on page 2)

!!!!!!!GIS News Going Digital !!!!!!!!

The GIS News is currently mailed to almost 2000 people at a cost to the GIS Users' Group of nearly \$1000.00. We will be completely online by January 2002 and at that time we will email the GIS News. **Please send your email address to kscheuerman@state.mt.us so we don't lose touch with you.** If you have any questions or comments, contact Katrina Scheuerman directly via the email above or call her at 406-444-5354. You can already view all the GIS News archives online at <http://nris.state.mt.us/gis/news.html>.

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Session Topics

The conference will emphasize the following topics, and papers will be presented on:

- Fire Applications
- Census 2000
- Geographic Control Database (GCDB) Issues
- Privacy Concerns
- Web-Enabled GIS
- Business and Industry Geographics
- Emerging Trends
- Environments and Resources
- GPS and GIS
- Education and Training
- Native American Issues
- Database and System Design
- Data Capture and Conversion
- Remote Sensing and Imagery
- State and Local Government
- Addressing Issues
- Public Works/Utilities

- Geodata Policy and Partnership
- Spatial Data Standards
- Transportation Systems
- Urban Planning and Management

For more information, contact:

Craig Rindlisbacher, Conference chair, 208-359-3020, craig@c1.rexburg.id.us or

Margie Lubinski, 406-329-3743, mlubinski@fs.fed.us

Visit the conference website for more information on the program, workshops, paper submittal, vendors and hotels at: www.intermountaingis.org

Web sites about Boise and the conference:

- Boise Convention & Visitors Bureau
<http://www.boise.org>
- Shopping in Boise:
<http://www.boise.org/cgi/web0/searchwbook.cgi/~boiseorg/vis/sho/shopping.html>
- Conference Contacts:
<http://www.intermountaingis.org/contacts.htm>

ArcView for Schools and Libraries

By Alex Philp, EOS

The Earth Observing System (EOS) Education Project at The University of Montana, in collaboration with ESRI's School and Libraries Program, has successfully secured a state-wide ArcView site license for all K-12 public schools in Montana. The first of its kind in the nation, the EOS Education Project will begin implementation and dissemination of the software through a concerted, year-long outreach effort to commence March 1, 2001. Included in the package, schools may receive ArcView 3.0, ArcView 3.2, and ArcView 8.0 software, a comprehensive data set including ESRI data products, NASA remote sensing imagery, and Space Imaging's Ikonos imagery, Montana data from the State Library, and an array of training opportunities through ESRI's Virtual Campus and EOS Education Project's ArcView online distance learning programs.

Alex Philp, Assistant Director for the EOS Education Project, states, "One goal of the EOS Education Project is to remove barriers that prohibit teachers from adopting GIS as an innovative classroom tool. One of those barriers has been the cost of the core GIS software package. Over the next year, we want to develop a national model through the delivery of software, data, and training to as many schools as we can. To achieve this, we call upon the entire Montana GIS Users Community to assist us in this effort and move toward the successful implementation of this program."

George Dailey, ESRI K-12 Education Specialist, is helping to fashion a coordinated plan of delivery and assistance with the EOS Education Project. "This is a great opportunity for the whole of K-12 education in Montana," Dailey said. "GIS tools and data destined for use in earth and space science classes will also be useful in geography, biology, community studies, math, and other subject areas."

"The statewide ArcView GIS license is a first, but doubtless not the last. This endeavor is not just about unlimited use of GIS software in K-12 classrooms. It's more than just access to tools. It requires access to support and training tailored to K-12 education," Dailey explained. "Through the EOS Center, schools will have access to GIS technical support and an active K-12 training effort including face-to-face instruction and a growing GIS distance learning program via the Web. ESRI's extensive education Web presence will provide Montana educators with a number of training and support avenues such as Virtual Campus courses, classroom modules at ESRI's ArcLessons Web site, our K-12 online forum, and the many components of our K-12 education site."

Interested parties can stay informed by visiting the EOS Education Project's website at <http://www.eoscenter.com/software.htm>, and by calling Meagan Bayless, State-License Coordinator, at 406-243-2644 or via email at: meaganb@eoscenter.com.

Census 2000 Geography Products

By Allan Cox, Census & Economic Information Center (CEIC)

The data collection phase of Census 2000 is now over and the first products are beginning to appear. There are several data products of interest to the Montana GIS community. Below are brief descriptions of the major data and maps coming from Census 2000.

TIGER/Line® 2000: This first release of TIGER is the Redistricting Census 2000 TIGER/Line files, designed to support the needs of state redistricting officials. The native format data files, as well as ArcView shapefiles in both geographic coordinates and Montana State Plane projection coordinates, are now available. County data may be downloaded from <http://nris.state.mt.us/nsdi/tgr2000/>. The data were converted and made available by a cooperative effort between the Census and Economic Information Center at the Montana Department of Commerce (CEIC) and the Natural Resource Information System at the Montana State Library (NRIS). It should be noted that these files do not contain Census 2000 population data, but will allow states to begin preparation for the analysis of the Census 2000 redistricting population data scheduled for release by April 1, 2001. The TIGER/Line files are extracts of selected geographic and cartographic information from the Census Bureau's TIGER (Topologically Integrated Geographic Encoding and Referencing) database. TIGER/Line files include "base map" features such as roads and streams. They are the first release of the Census 2000 tabulation areas, including the census tract and block numbers that are the foundation for the redistricting process. Documentation, including a list of states for which data are available, may be obtained by clicking on the "TIGER" link on the Census Bureau's Internet homepage (<http://www.census.gov>). A second release of TIGER/Line 2000 is planned for late spring, 2001. This second release will include boundary information for ZIP Code Tabulation Areas (ZCTA) and

updated Census 2000-based address ranges.

Using the TIGER/Line 2000 data, CEIC has created a new ArcView shapefile of county boundaries for Montana. In the 2000 Census, there were boundary changes for Park and Gallatin counties in relation to Yellowstone National Park. The boundaries for Yellowstone National Park have been removed from the state. This data set may be obtained from CEIC at <http://ceic.commerce.state.mt.us/Maps&GIS/Data/index.htm>. A new statewide shapefile of places—cities and census designated places—is being created and will be made available as soon as possible.

Public Law 94-171 Data: The actual population counts from Census 2000 are contained in the Public Law 94-171 data (PL94-171). The PL94-171 statistical summaries contain population totals and summaries by race, Hispanic or Latino, and voting age for all appropriate geographic areas delimited on the maps: state, counties or equivalent areas, voting districts, county subdivisions, places, American Indian/Alaska Native/Native Hawaiian areas, census tracts, block groups, and blocks. To be used in a GIS, the PL94-171 data need to be joined to the census geography blocks in the TIGER/Line 2000. The data will also be joined on a statewide basis by the CEIC and NRIS programs and made available as GIS datasets by CD and via the Internet during April 2001.

Block Maps: The Census Bureau's block maps show the greatest detail and most complete set of geographic information. These large-scale maps depict the smallest geographic entities for which the Census Bureau presents data—the census blocks—by displaying the features that form block boundaries and the numbers that identify them. The intent of this map

series is to produce a map for each governmental unit (e.g. American Indian areas/Alaska Native areas/Hawaiian home lands, county, place, and functioning minor civil division) on the smallest possible number of map sheets at the maximum practical scale. The lowest level of geography: Census Block. For Montana, there are over 1,400 individual block maps. The paper versions of these maps will be available beginning in the second quarter of 2001. A complete set of the maps will be distributed as Adobe PDF files on DVD, via the Internet (PDF), and on CD-ROM beginning in third quarter 2001. CEIC will make the PDF files available and will plot color paper versions of the maps upon request and for a materials charge.

There are other maps and geographic products that will be released in the coming years. CEIC will provide further information and alerts about these products as we get closer to their release. The "long form data" that describe housing, education, and income characteristics will begin to be released in the fall of 2001 and continue through 2003. Much of the characteristic data may be joined to census geography—counties, tracts, and block groups. In order to safeguard citizen confidentiality, none of the "long form" characteristic data will be released at the block level. For a list of future products and the scheduled release dates, visit <http://ceic.commerce.state.mt.us/C2000/index.htm>.

More information about Census 2000 products and data may be obtained by visiting the Census web site at <http://www.census.gov> or contacting CEIC at 406 444-4393 or at <http://ceic.commerce.state.mt.us>.



United States
**Census
2000**

GIS as a Tool for Redistricting Legislative Districts

By Susan Byorth Fox, Legislative Services Division

An arcane decennial exercise is upon us once again—districting and apportionment. It is triggered by the decennial census provided for in the U.S. Constitution. There are at least three major impacts that will be felt from this process.

The first impact has already been felt from the release of the Census 2000 total state population counts—the continuation of Montana being the largest of the seven states that have a single congressional representative. As the population of the United States was apportioned among the 50 states, we found ourselves 8,168 people short of receiving back the district that we lost following the 1990 Census. The “redistricting” of our Congressional Delegation becomes simple.

The second impact will be felt when we receive the actual population counts at the census block level. Based on the apportionment of the population among 100 house districts, the Districting and Apportionment Commission will redistrict accordingly. Commission staff will use GIS to redraw the legislative boundary lines in a technical process that was used for the 1990 round and will again be used for the 2000 round. The technological leaps over the past decade have allowed evolution from the use of a redistricting application and ARC/INFO on a UNIX operating system to one that uses a redistricting application and ArcView on a PC platform. The Commission uses two databases from the U.S. Bureau of the Census. The geographical database is the TIGER/Line file and the population database is the P.L. 94-171 data that attaches population data by race and voting age to specific census blocks that are used to build legislative districts.

The Legislative Services Division, that has the responsibility to support redistricting, has chosen to use autoBound, an ESRI ArcView Extension, from Digital Engineering Corporation. Since it is an ArcView-based system, the Commission will be able to accept shapefiles generated from other systems if interested parties want to generate their own plans for redistricting. The main point for redistricters to remember is that no locality is an island and there is always a ripple effect, coming from the districts that were designed before, that will pass through the area that is being redistricted and that will continue to ripple through to the next districts. The puzzle is not finished until all 100 districts are completed and within the 10% overall deviation in population.

Redistricting is a blood sport in many states, but Montana has reduced much of the bloodshed by removing the process from the Legislature through the use of a public bipartisan five-member Districting and Apportionment

Commission. Four members were selected by the House and Senate Majority and Minority Leaders to represent the geographical areas of the state, and the presiding officer was selected by the Supreme Court as is provided in the Constitution when the other four appointed members couldn't agree. Each party will seek to maintain any political advantage enjoyed in the past and to strategically position themselves for the future.

The basis for redistricting is the constitutional guarantee of equal protection or “one-person, one vote,” and the ideal is to create districts of equal population. However on a practical level, the districts are allowed a plus or minus 5% deviation from the ideal population, which comes in handy when dealing with the variations in Montana's geography.

The protection of minority voting rights in order that all persons have the opportunity to vote for a person of their choosing is another mandatory criteria for redistricting. In Montana, the most obvious areas of impact are the Indian Reservations, although the U.S. Supreme Court has ruled that race may not be the predominant consideration. Other discretionary criteria that are followed include creating compact and contiguous districts and following political subdivision lines and communities of interest. Staff will travel across the state contacting election administrators and the Central Committees of each political party, along with local politicians and interested citizens. The commission will hold public hearings statewide as well. To the extent that counties have GIS with any of the election precincts or other information incorporated, sharing data could be very useful.

The third impact is at the county level. The counties are statutorily required to change precinct lines to the new legislative lines, if necessary. This is problematic in many cases where the TIGER/Lines doesn't provide a good basis for crafting the written legal descriptions also required in law. It is a problem that staff is aware of and will be trying to mitigate to the greatest extent possible. The new districts will become law in time for filing for the 2004 legislative elections.

Redistricting is not a nonpartisan activity, and the use of such a powerful tool as GIS allows the splitting of the proverbial hair. Population flux in Montana has generally been from east to west, rural to urban, and sometimes one has to go a long way to find the necessary population to create a district. It is difficult news to deliver when districts are being lost, and even the creation of a new district causes consternation to those vested in existing districts. Yet, no matter how you slice it, redistricting is an exciting

(Cont. on page 5)

process involving an opportunity to travel around the state and learn more about the electorate in their own communities. The use of GIS and its beautiful mapping capabilities will be greatly beneficial in providing information about

upcoming changes and will assist in educating Montana's population about our democratic process and our privilege of being equal under the law.

The status of GIS in the Northern Region of the USFS

By Kim Foiles, USFS

GIS awareness exploded with the past fire season as a great many agencies and the public benefitted from GIS maps and analysis. GIS resources were stretched to the limit and we had a shortage of qualified GIS personnel to staff teams and fire camps. Due to the major fire season, fire budgets have increased allowing us to concentrate on GIS activities which supported the fire effort. This is great news.

Region One of the Forest Service (Northern Idaho, Montana, North Dakota and most of South Dakota) is emphasizing the completion of five of the 15 corporate layers this year as defined in our GIS Core Data Dictionary. These themes are:

1. Current Vegetation
2. Watershed Boundaries (4th, 5th and 6th Hydrologic Unit Code levels)
3. Stream
4. Roads and Trails
5. Land Ownership - Administrative boundaries

The GIS Core Data Dictionary defines an Agency-wide standard set of spatial layers that provide the basic resource data necessary to address a wide variety of general resource questions across administrative boundaries. GIS Core Data are designed to simply, efficiently, and without redundancy, describe the landscape features most commonly described or analyzed during analyses using spatial data.

Another goal of Region One this year is to implement two of our national databases. These are FSVEG and TERRA. These are part of a national database effort called NRIS (not to be confused with the Montana agency of the same name).

NRIS is a powerful relational database and set of analytical tools for natural resource information (water, air, land, fauna, human dimensions and vegetation). NRIS is designed to implement consistent corporate data standards. It is intended to ensure compatibility and linkages among interagency, national, regional, and station efforts in natural

resources information management. It supports agency-wide data collection protocols and classifications. It also produces various reports linked to spatial elements in ArcView. NRIS facilitates the concept of collecting data once, and using it often and provides access to and allows the sharing of data and information at multiple geographic scales.

The first database we are concentrating on is FSVEG which is bringing consistency to field sampled data. FSVEG is an Oracle database used to store data from grid based strategic inventories, permanent remeasured inventory plots, and operational inventories like stand examinations. The database is composed of tables of information about plot setting, tree measurements, cover measurements, downed woody debris, ecological and site productivity classification, insect and pathogen observations, ownership, and treatment history.

The second database is Terra. The terrestrial module of NRIS, or Terra, is an Oracle-based database and set of applications designed to help resource managers accomplish their work by applying Terrestrial Resource information. The systems is designed to improve the consistency and utility of Terrestrial Ecological Unit data at multiple geographic scales and across administrative boundaries. It integrates attributes of soils, geology, geomorphology, range vegetation, and climate data for use in mapping, describing and analyzing ecological units. These data are used in planning, prescribing, implementing and monitoring resource management activities. TERRA produces a variety of reports, presenting data for analysis and spatial displays, along with an analysis tools package (ETOOLS), a GIS Linkage to ArcView, and allows users to customize applications.

On another note, we are excited to get Windows 2000 on our desktops with Arc8 and ArcView extensions, Spatial Analyst, 3D Analyst and Network Analyst. Hopefully this will empower more people to use GIS to analyze data on their own.

The Department of the Interior's Prairie Pothole Digital Orthophoto Project

By Lance Clampitt, USGS

Have you ever wondered what the Department of the Interior's Base Mapping Working Group is and how they coordinate needed geospatial data for the nation?

The Interior Geographic Data Committee (IGDC) established the Base Mapping Working Group in 1993 to coordinate the identification of requirements among Department of the Interior (DOI) bureaus for the collection of digital geospatial base data. The Working Group consists of representatives of the Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation, Minerals Management Service, National Park Service, Office of Surface Mining, U.S. Fish and Wildlife Service, and the U.S. Geological Survey. So how does the process work?

In October of each year, 200 requirements solicitation packages are distributed to DOI headquarters and field offices identified by the DOI Base Mapping Working Group. The solicitation responses for base data requirements are returned to the USGS, National Mapping Division at the end of January in hopes of multi-agency support for base cartographic data. An automated process is used to record and consolidate incoming requirements and to compare these requirements against USGS inventory and production authorization data

bases. The resulting group of unmet requirements is analyzed, and benefit-cost summaries and graphics are prepared for those areas containing multi-bureau requirements.

In early April, the Base Mapping Working Group meets in Denver to analyze the results of the requirements solicitation and to select priority areas for map revision and digital data production in the upcoming fiscal year. Because the cost of addressing all of the outstanding requirements averages 25 times greater than available DOI Program funding (\$11M), the Working Group uses a selection process that gives priority to multi-bureau data requirements in geographic areas that support departmental or bureau priorities. Funding caps are applied to the selected priority areas based on the number of bureaus requesting products in each area to ensure that a diversity of DOI programs and applications are supported. Following the requirements solicitation and selection the USGS National Mapping Division Headquarters and Mapping Center staff work with the requesting organizations, as needed, to identify the product mix and project locations for those areas selected for funding in the upcoming fiscal year.

Under the FY01 solicitation the Montana Prairie Pothole region was supported and subsequently selected

under the DOI program with a goal of enhancing the conservation and management of the Prairie Pothole ecosystem of northeast Montana through the use of USGS Digital Orthophoto Quadrangles or DOQs. The proposed area contains large tracks of threatened native mixed-grass prairie, as well as the highest density of wetlands in Montana. Numerous agencies are working to protect and manage the unique and threatened resources of the Prairie Pothole region. DOI agencies including the U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation and U.S. Geological Survey have all supported the prairie pothole region as a recipient of DOI Base Mapping Funds. The USGS is currently producing DOQs in the identified Prairie Pothole region (-104 to -107 degrees longitude and 48.15 to 49 degrees latitude) with an estimated completion date of December 2001.

The DOI High-Priority Digital Base Data Program is funded and administratively managed by the USGS, National Mapping Division. Key program objectives for the USGS include minimizing redundancy in the production of digital data and maximizing the number of customer requirements satisfied for each product generated.



Maintenance and Application of Cadastral Information at Montana

Department of Revenue

By Ted Chase, DOR

For the past several years, Montana Department of Administration, Information Services Division (ISD) has been spearheading the collection and conversion of Cadastral data in the State of Montana. By the end of 2001, nearly every county in the state will have cadastral data. As focus on conversion begins to wind down, the new focus for this data set will be data maintenance, enhancement and delivery. Already, ISD has begun work with the Bureau of Land Management on improving GCDB (Geographic Control Data Base) in certain areas of the state and designing the migration of Cadastral data into a SDE (Spatial Data Engine) environment. As part of the data maintenance component, the Montana Department of Revenue (DOR) has undertaken efforts to ensure the data is kept current and accurate.

Since 1972, DOR has been mandated by state constitution to assess all property in the state. Among the tools DOR uses in their assessment efforts are parcel maps and Computer Assisted Mass Appraisal (CAMA) data. DOR currently employs nine GIS cartographers throughout the state (Libby, Shelby, Great Falls, Helena, Butte, Bozeman, Livingston, Billings and Glendive). These cartographers have expertise in CAMA data, deed processing, parcel mapping, legal/survey land descriptions, and GIS technology, specifically ESRI COGO and Arc/Info. It is the duty of each of these cartographers to maintain parcel data in assigned counties so that DOR appraisal staff can effectively complete their responsibilities.

Transition from Conversion to Maintenance:
Once ISD completes conversion in a county, DOR cartographers assist ISD in several final processing, annotation and data quality control tasks to ensure the data is accurate and complete. When a county has all parcels digitally mapped and annotated with the geocode and some basic road and water text, map plots are generated for the local DOR offices and, at times, the county Clerk and Records office. Concurrently, DOR staff complete data entry on newly generated geocodes for public lands (tax exempt lands) in the CAMA database. These new public land geocodes never existed in CAMA prior to parcel conversion. Once CAMA is updated and map plots delivered to the county, a GIS parcel maintenance kick-off meeting is conducted with DOR staff in the local county office to review what new processes are required of the local office. Briefly, when a parcel is split, the new parcel is assigned a new geocode and the local DOR staff inputs the related parcel information into CAMA. Afterwards, the deed and survey are forwarded to the assigned DOR GIS cartographer to update, attribute and annotate the parcel data. New

splits are sent to a cartographer every 30 days by local DOR offices in each county. A QAQC routine is also run by the DOR cartographer to ensure the geocode exists both in the GIS data and CAMA data. Lastly, a new map plot of the township or section that contains the split is generated and forwarded to the county within 30 days of receiving the split from the local office. Old parcel maps are discarded.

Work is currently taking place to reduce the entire waiting period of updating parcel data from the 30 to 60 day timeframe to a waiting period of several days, or better.

Public or exempt land information also needs to be kept current. A number of agencies are currently researching and strategizing efficient processes to maintain public land information in the Cadastral database.

Application:

Because of more and more counties having cadastral data, DOR is learning how spatial data can be leverage in parcel assessment. For example, recently efforts to identify parcels within certain neighborhoods with certain sales values have begun. The sales information is extracted from CAMA and linked with the parcel data for a new sales map. Based on this spatial information, neighborhoods can be adjusted by appraisers for market modeling and assessment purposes. There are a number of these CAMA mapping applications DOR will be developing.

Future efforts to leverage the value of the cadastral data within DOR include stronger integration with DOR new CAMA data management product VISION. VISION will provide some desktop GIS functionality to DOR staff. Staff will be able to query and analyze parcel data in conjunction with CAMA data. VISION uses shapefiles for its GIS applications. More specialized requests will be fulfilled by DOR Cartographers or through partnerships with other state agencies and/or county GIS departments.

If you have any questions about the Montana Department of Revenue and how DOR maintains and uses parcel information, please feel free to contact Ted Chase, DOR GIS Program Manager, at (406) 444-0200 or rchase@state.mt.us.



The New NRIS

By Jim Hill, NRIS

There is no doubt about it – NRIS has undergone considerable change over the past year, so it is understandable that I should be asked to describe the “new” NRIS. So what’s new about NRIS?

A new strategic plan.

Our staff spent many long hours and our users contributed many well thought out issues, concerns and recommendations regarding NRIS’ long term goals and our niche in the world of information management and dissemination. The result is a strategic plan that will serve us well as we enter the new millennium – but probably not for long afterward. We realize that in the world of information technology, the meaning of “long-term” may be just a few short years, and that our strategic plan must be as dynamic as our business in order for us to keep serving our users’ needs. Twelve years ago, GIS as a tool for acquiring, managing and disseminating natural resources information did not exist at NRIS. Eight years ago, NRIS acted as a service bureau for state agencies in need of GIS services and unable to obtain them in the private sector. Four years ago, NRIS served geo-spatial data over the Internet for use by GIS technicians having access to powerful desktop GIS applications. Four weeks ago, NRIS launched a web-based mapping application that brings GIS functionality and access to hundreds of gigabytes of natural resources data to users anywhere in the world having nothing more than internet access.

Our strategic plan identifies our top goals as:

- **Data Development:** Acquire, integrate, maintain and insure accuracy of spatial and natural resource data and information needed for managing Montana’s natural resources and environment; and

- **Data Delivery:** Effectively disseminate natural resource data and information, ensuring broad accessibility, utilizing current technologies, and maintaining a strong emphasis on customer-service.

The Internet has drastically affected how NRIS will go about achieving those goals, and NRIS is well equipped to take advantage of that tool. The NRIS program has acquired and deployed a state of the art web platform designed to provide powerful and integrated spatial data access to the data in the NRIS clearinghouse. The centerpiece of this hardware architecture is a quad-processor 500mhz pentium III computer, with over 100 gigabytes of hard-drive storage, coupled with Microsoft SQL Server and Environmental Systems Research Institute’s Spatial Database Engine (SDE). This data platform allows us to store and serve many spatial and tabular data layers from a single, high performance, database platform. Coupled with a dual processor web server, and 2 dual processor application servers, this NRIS web infrastructure provides a high performance, scalable, and reliable web platform for our clientele.

New staff

You will see several new faces when you visit our office. Within the last year, NRIS has acquired a new systems administrator, a new GIS programmer analyst, and a new GIS data technician; our Natural Heritage Program has acquired a new Web developer. As the NRIS director (also new), I can say that we are extremely pleased with the talent that these people bring to our program, and that although the loss of expertise that we experienced when existing staff left the program cannot be overstated, we have worked quickly to restore our level of service to that which our customers have come to expect.

You will also see several old faces when you visit our office. Many of the dedicated staff that have grown up with the program are still with us today, each holding an incredible amount of institutional knowledge about our clearinghouse and our users.

Our current staff of 10 at NRIS have a combination of 10 Bachelor’s of Arts or Sciences Degrees (Geography, Geology, Computer Science, Zoology, Wildlife Management and Microbiology) and 4 Master’s of Science degrees (Geography, Biology and Microbiology). This combination of disciplines provides a unique blend of strong skills in both geographic/cartographic skills along with biological and natural resource skills and experience.

- **GIS / Cartographic Experience** – Our staff have over 30 years of combined experience using all aspects of ArcInfo for GIS analysis, map production, and programming
- **Database Development** – Our staff have over 30 years of combined experience developing and maintaining complex relational databases
- **Application Design/Systems Analysis** – Our staff have over 20 years of combined experience with application design and systems analysis
- **Web design / application development** - NRIS has deployed and maintained an active web presence since 1994. Our staff have over 15 years of combined experience in web design, deployment, and application development.

New data and data-access tools

NRIS continues to acquire new data, to update old data-sets, and to develop new data-access tools to make the clearinghouse truly a one-

stop shop for natural resource data in Montana. Recent additions to the clearinghouse include:

- NRIS recently deployed its all new Thematic Mapper. Using only a browser, Internet users can now search, extract, and summarize many types of spatial data from a single interface. Try it out at <http://nris.state.mt.us/mapper>.
- The 2000 TIGER Files are now available for download in ESRI Shapefile format.
- Get Monthly Snow and Water Information with maps and reports developed with data from NRCS. Recreationists, irrigators, fisheries personnel, and others, including the Montana Drought Advisory Committee, use this information to evaluate current and seasonal surface water supplies.
- The Legislative Districts Map has been updated for 2001.
- The Forest Service Research Natural Area (RNA) network protects some of the finest examples of natural ecosystems for the purposes of scientific study and education and for the maintenance of biological diversity. National Forests and Grasslands in 12 western states manage an exceptional suite of 263 established and 55 proposed Research Natural Areas.
- Our new Corps of Engineers 404 Permit system is now available. This system allows users to locate 404 permits issued in Montana since 1990 and features the new NRIS Interactive Mapping Application.
- Our 1:100,000 scale Public Land Survey and land ownership data are now available as single, merged files for the whole state. See the Detailed Statewide Data List for links to the two data sets in e00 or shapefile format.
- A Gap Analysis of Montana, a 4 CD set published by the National Gap Analysis Office and produced by the Montana Gap Analysis Project, Wildlife Spatial Analysis Lab, Montana Cooperative Wildlife Research Unit, and the University of Montana, is now available from NRIS. For a copy please send your name, address, and affiliation to Katrina Scheuerman at NRIS.

- Year 2000 Hunting Districts for Antelope, Bear, Deer - Elk - Mountain Lion are now available at <http://nris.state.mt.us/gis/datalist.html#ad>.
- TIFF images of all Montana's 1:24,000 scale quadrangles are now available in State Plane Coordinates, with their collars removed. Quadrangle images in other formats and scales are available on our Digital Raster Graphics Page <http://nris.state.mt.us/nsdi/drg.html>.

Same old desire to serve

While we continue to search out new tools for information acquisition and dissemination, hire new staff to replace those who have left us or to acquire new skills, and to constantly improve our clearinghouse, one aspect of NRIS has not changed – the NRIS staff shares a mutual desire to be the best resource available to state agencies, private businesses and all Montana citizens when it comes to locating and using information relating to Montana's natural resources.



MTGIS Offers K-12 Competitive Grant



By Michael Sweet, University of Montana

The Montana GIS Users' Group (<http://mtgeo.org/mtgis>) is announcing a request for proposals for a \$1,000 grant to develop a K-12 Curriculum to bring Geographic Information Systems (GIS) into the classroom. The focus of the project is to create a curriculum that merges existing subject curriculums with GIS technologies. The grant will be awarded on a competitive basis by the Board of Directors of the Montana GIS Users' Group. Applications for consideration are due by April 15, 2001.

The curriculum can apply to a specific subject (science, social studies, etc.) but incorporates GIS as part of the required problem solving skills. The format should be similar to Project Wet and Project Wild, so other teachers have the potential to adapt the concepts to their existing curriculum. The Montana GIS Users' Group is particularly interested in proposals that include a field data collection component.

An advisory committee will be appointed by the MTGIS Board to assist the successful grantee(s) and review progress. The MTGIS Board may be able to direct grantees to GIS professionals in their community that can offer assistance.

For a complete grant application, please go to http://mtgeo.org/MTGIS/Grants/Grant_Prop2001.htm

Yellowstone to Yukon Framework Data Demonstration Project

By Tony Thatcher, Mountain West GIS Cooperative

The Yellowstone to Yukon Conservation Initiative (Y2Y) seeks to protect wildlife habitat and movement corridors through a variety of parks and zoning and easement mechanisms throughout the northern Rocky Mountains and adjacent ranges of North America. The Initiative, comprised of over 150 separate organizations, is the largest land-based conservation effort on this continent. As such, it faces unprecedented challenges in achieving its vision across multiple jurisdictions.

Some of these challenges are technical. If wildlife habitat is to be protected, it must be correctly identified and prioritized. GIS analyses and mapping are heavily used to these ends. However technical obstacles to GIS analysis across provincial, state and especially the Canadian/U.S. border impede these efforts. Obstacles range from different approaches to modeling the Earth's surface (datums, map projections), to different hardware and software platforms used, to difficulties in sharing data due to varying approaches to copyrights.

In June 2000, 22 GIS-oriented partners entered into a contract with the U.S. Federal Geographic Data Committee (of the U.S. Geological Survey) and Canada's federal GeoConnections (Natural Resources Canada) to overcome these obstacles. In exchange for funding, the Y2Y partnership agreed to merge key datasets across the U.S. – Canadian border in an area known as the Crown of the Continent. Furthermore, with the assistance of the U.S. National Biological Information Infrastructure (NBII), they will set up two NBII 'nodes' capable of distributing these datasets and associated metadata between the two countries.

On November 19-21, 1999, Y2Y convened a diverse group of top scientists in Jasper, Alberta, with particular strengths in large carnivore and aquatic ecology. Led by the IUCN's bear committee chair, Dr. Stephen Herrero, and the founder of conservation biology, Dr. Michael Soule, this group identified key layers needed to address transboundary ecosystem questions on such a broad scale. Specifically, in order to develop a transboundary strategy that addresses ecological connectivity and integrity questions, they recommended that Y2Y develop fifteen themes of information.

On April 13-14, 2000, GIS analysts from throughout the Intermountain West convened to assess the framework datasets and mechanisms needed to provide these layers of information across the Y2Y region. Several GIS datasets consistently reoccurred as they evaluated each of the scientist's themes – these were deemed 'framework' data.

The core layers which emerged for Y2Y's framework dataset were:

- hypsography (landform or Digital Elevation Model) (Resolution: 25-30m)*
- Landsat 6/7 TM and regional IRS orthoimagery (Resolution: 30m/15m with 5mIRS samples)*
- hydrology (Scale: 1:20000/1:24000)*
- roads and trails (Scale: 1:20000/1:24000)*
- resource extraction (mines, wellsites, cutblocks) (Scale 1:20000/1:24000)*
- AVHRR-derived land cover (Resolution: 1km)*
- government units (Scale: 1:20000/1:24000)*
- some cadastral (parks, wilderness areas, national/state forests, private land)*
- climate (varies)
- census (to rural census division)
- toponymy (placenames) (Scale: 1:20000/1:24000)*
- geodetic control to ensure consistent integration of layers*

Secondary layers included:

- land claims/reserves/cultural elements (Scale: 1:20000/1:24000)*
- land use zoning (Scale 1:20000/1:24000)
- MODIS imagery (assorted sensors)
- watersheds (to HUC 6)
- species richness (index of biodiversity)
- special elements

This project is focusing upon themes marked with an asterisk*, given present availability of data.

Upon completion, the core data sets and associated metadata will be available for download from various US and Canadian clearinghouses and archive sites. The project team is currently forming the partnerships necessary to permanently archive and distribute these data. This should be in Spring 2001.

For more information please contact Tony Thatcher at tony@dtmgis.com or visit the project web site at <http://www.rockies.ca/framework/results.htm>.



I-Teams – What You Should Know

By Stu Kirkpatrick, DOA, ISD

1. What the hell is an I-team?

Emerging from a Federal Office of Budget and Management (OMB) document “Implementing a New Paradigm” comes the concept of Implementation Teams or I-Teams. In OMB’s words “I-Teams will organize institutions in their state of region to build statewide portions of the National Spatial Data Infrastructure (NSDI) Each Team, aligning the needs and resources of its state, local, tribal, federal, and private sector partners, will prepare a comprehensive plan for compiling, maintaining, and financing spatial infrastructure in its Team area. It will identify the needs and responsibilities of the partners, align and leverage resources, and establish detailed timetables and performance measures.” Additionally, OMB calls for each state I-Team to be aligned with a Federal Partners Team, a Financing Solutions Team and a Technology Advisory Group.

2. So how does this differ from what has been going on before?

The OMB plan finally recognizes spatial data as part of our nation’s capital infrastructure and recommends funding collection and maintenance of it much like we fund roads, bridges and utility lines. Again quoting from ‘Implementing a New Paradigm,’ “Spatial Infrastructure has become an essential part of the nations capital infrastructure. Despite this fact no widespread capital financing model for GIS has emerged. Spatial infrastructure, an intergovernmental capital asset, continues to be funded by ‘stovepiped’ annual appropriations. This mismatch between the need for long-term capital financing and the current reliance on annual appropriations remains one of the chief obstacles to the attainment of the NSDI.”

3. Sounds good – how do we join up?

Well As good as it sounds it has not been a very well organized effort up to now. Neither OMB nor Federal Geographic Data Committee (FGDC), the founders of the NSDI concept, has distributed much pertinent information on just how states should go about constructing I-Teams. OMB has issued some guidelines on what the plans should contain however firm dates haven’t been set for a state’s completion of the plan. Rumors abound as to when and what a state should submit. No funding is available to complete the plans and we are not really sure who may read them if they are submitted. There is the possibility that this idea is one of those “here today, gone tomorrow” ideas.

4. What is Montana’s response going to be?

The Montana Geographic Information Council (MGIC) was given a recommendation from the Infrastructure and Coordination committee to submit I-Team plans for three framework data layers – Transportation, Hydrography and Cadastral. At the December meeting of MGIC, the Council recommended that the state’s technical groups (Interagency Technical Working Group (ITWG) and Montana Local Government GIS Coalition (MLGGC)) coordinate the completion of plans for as many NSDI framework layers and other important layers as possible. MGIC recognized that while the national effort may be disorganized, and possibly fail, the concept of adopting a plan for the collection and maintenance of statewide datasets is sound and should be explored.

In their January meetings, ITWG and MLGGC adopted strategy for completion of plans for important statewide data sets. Recognizing that meaningful plans could not be completed by a rumored OMB February deadline the best policy would be to:

- Find team leads for each data set (This was done at the January meetings);
- Complete one-page summaries of current status and future plans for at least eleven data sets (layers) by February and post those to a web-site for review;
- Submit a compilation of the one-page summaries to both FGDC and OMB to act as a placeholder until complete plans can be written;
- Find interested participants to work on teams (mini I-Teams) for each layer;
- Hold group meetings in Bozeman on April 10, 2001 to start working on comprehensive plans; and
- Engage members of MGIC to act as a state Financial Solutions Team.

5. What can I do?

Go to the I-Team web page at <http://gis.doa.state.mt.us/mtgeo/framework>. Read more about the process. Become familiar with what data sets Montana is working on. Pick one of interest to you, travel to Bozeman on April 10, and help participate in defining the Montana Spatial Data Infrastructure. It’s the right thing to do.

"Busy and Exciting GIS Day 2000 in Missoula"

By Bryant Ralston, ESRI

NASA's Earth Observing System (EOS) Education Project hosted Missoula's second annual GIS Day event on the University of Montana campus on November 15th. Additional sponsors included the National Lewis and Clark Education Center, the United States Forest Service, Missoula County, City of Missoula, the Montana Geographic Alliance, and the Missoula-based businesses of Geodata Services, Benchmark GIS, Education Planning Solutions, MountainCAD, and ESRI. To top it off, the mayor of Missoula made a declaration for the community to officially recognize it as "GIS Day." Thanks to all the sponsors and supporters for making the day a big success!

Alex Philp, Assistant Director of the EOS Education Project, states "GIS Day 2000 was a major success for the GIS community in Missoula. The EOS Education Project was honored to have ESRI choose our event as one twenty SuperEvents in the world, and we are already making plans for GIS Day 2001."

With a superevent status, the excitement and enthusiasm of the students definitely made the day super! The event provided the opportunity for over 200 Missoula-area students to learn GIS skills "hands-on," examine NASA remote sensing imagery and the latest GPS equipment, and experience a variety of Internet-based Map, Image, and document services. Missoula area teachers also had a chance to expand their skills in anticipation of expanding their use of GIS in their classrooms. The theme of the student exercises was centered on utilizing GIS to learn about the Lewis and Clark Expedition route through Montana and beyond.

In the afternoon, ESRI and the EOS Education Project jointly announced a statewide Montana site license for GIS software, data, and online education. The first of its kind in the country, this license will provide software, geographic data, and training opportunities to every K-12 public school in Montana. The local press and TV stations were on-hand and interviewed the director of the EOS Education Project, John Kuglin, to get the word out to the public regarding the day's activities. A open-house public "GIS Poster Night" and panel discussion entitled, "GIS and Fires of 2000" rounded out what was a very busy and exciting GIS Day in the Garden City.

Already, plans are underway for GIS Day 2001 and once again the Montana GIS community has been extremely supportive of this year's events and announcements. This year, please do not hesitate to get involved with your local schools to assist them in successfully using GIS in classrooms across the Big Sky state!

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